

Safety Issues Related To Traffic Impact Analysis

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INTRODUCTION

Traffic impact analyses have been a requirement of development as well as other circulation projects for over 30 years. The emphasis has generally been directed toward the ability of the transportation system to accommodate projected demands and traffic operational issues. These analyses also provide an opportunity to review safety features prior to the development of final plans. In this way, a traffic impact analysis could be considered a “Road Safety Audit” for other than road projects.

In preparing traffic impact analyses for many years on various types of projects, the opportunity to consider safety has been applied. This again is similar to a “Road Safety Audit” in that it is an independent review and responses are generally required. Some safety considerations that are typical to various types of developments are discussed below.

INTERSECTION SIGHT DISTANCE

Providing adequate sight distance at intersections is a basic consideration. There are several specific design features that can adversely affect sight distance. The location of a side street on the inside of a horizontal curve is a common concern. With this condition, it can be necessary to recommend traffic controls such as STOP signs or traffic signals. Other potential mitigation recommendations can include redesign, modified grading and limitation of roadside and median landscaping.

Sight distance concerns can also occur on-site. In retail or industrial developments, parking areas can have landscaping provisions. These can result in visibility limitations for both drivers and pedestrians. Restrictions on the type and location of plant materials can be used as mitigation.

OFFSET INTERSECTIONS

Offset intersections can be a positive or negative design feature. If the offset is designed so that left turns from the major street are conflicting, a safety concern exists. The design, which provides left turns from the major street without conflicts is desirable. This design results in two “T” intersections with reduced conflict points and no conflicting left turn movements from the major street.

Another offset concern can exist where one half of a road is constructed on each side of an intersection. If these half roadways do not align, a transition with signing and marking is needed. In one case, this condition was not addressed and a crash occurred due to the driver not being aware of the offset. Both sections were built to approved plans; however, no one appeared to have considered the discontinuity problem.

ON SITE INTERSECTIONS

On-site intersections in residential areas can be a safety feature. Specifically, “T” intersections are more desirable than four-way. With the “T” intersection, conflict points are reduced and, generally, the need for control is reduced. Drivers approaching from the stem of the “T” have a tendency to yield to cross traffic. The “T” design also discourages higher speeds and can be utilized in a pattern to discourage through traffic. A benefit can also be achieved with respect to pedestrian safety due to reduced traffic movements.

ON SITE TRAFFIC CONTROL

Commercial and industrial developments can be a size or complexity that result in a significant on-site circulation system. Designs should be reviewed with respect to potential sight distance concerns. Pedestrian circulation must also be examined. Walkways and clear routes from parking areas are needed along with traffic calming devices in some designs. Pedestrian routes should parallel parking aisles so that pedestrians do not emerge from between parked vehicles and cross travel ways.

Striping, pavement markings and channelization can be required for the safe movement of vehicles and pedestrians. Large paved areas with no delineation are undesirable and do not provide guidance to drivers or pedestrians. On-site traffic control should be considered in the same detail and with the same principles as off-site streets.

ON-SITE GEOMETRICS

The design of the on-site circulation system should be examined to ensure that it is adequate to accommodate anticipated usage. Where trucks are utilized, the geometrics should be reviewed to ensure their movement and access to facilities such as loading docks. In all developments, consideration must be given to emergency vehicles and trash trucks. Some jurisdictions do not permit trash trucks to back. Additional emergency access can be required in some cases.

Schools and other facilities that have passenger drop off / pick-up operations require additional analysis. A separation of bus and private vehicle circulation and loading/unloading areas can be required. It is also critical to ensure that on-site circulation will not be hindered by vehicles stopped to load or unload passengers.

Pedestrian / bicycle circulation and safety must also be considered in the operation of these facilities.

PEDESTRIANS, BICYCLES AND EQUESTRIANS

Non-motorized facilities can also contain safety related concerns. Paths or other provisions should lead to locations where the crossing of roadways can be made in the safest manner. Paths that lead to mid-block crossings should not be permitted. In special cases, it can be recommended that crossings for pedestrians, bicyclists or equestrians be signalized. Care must be taken to locate push buttons for actuated signals in positions that can be accessed by these users. As an example, a push button mounted at a height for an equestrian can be required.

While not strictly in the category, golf carts and similar vehicles can also be a consideration. There are locations where a golf course crosses a roadway and provisions are required for safety. This can be signing, signal or grade separation. In some areas, golf carts are allowed to travel on public streets. These locations require safety provisions.

TRAFFIC BYPASS

A condition can exist in a design that would allow or encourage drivers to use local streets and/or private development to bypass a major intersection or other possible delay conditions. These conditions may not be evident at first review and require an experienced person to evaluate. Overall street patterns of a development should be reviewed on their own as well as in relation to adjacent development. Street layouts that discourage use by non-local traffic are desirable.

LONG TANGENTS

Streets with tangent alignments in excess of a quarter mile can result in speeding problems. In some cases, a quarter mile drag strip has been marked immediately after paving. This condition can also be avoided with carefully planned street or road systems.

TRAFFIC CRASH DATA

In some cases, it could be important to examine the crash history of the street or road system that serves the project site. Discussion with the responsible jurisdiction can provide identification of existing safety concerns. The analyses should examine the potential impact of the project. A project could mitigate an existing problem by adding traffic controls, realigning roadways, providing new facilities or other improvements. If

the project would exacerbate the problem, the impact should be analyzed and mitigation identified.

SUMMARY

Traffic impact analyses can be utilized to evaluate safety factors related to planned development. Since they are conducted prior to final project approval, require a response and are prepared by an independent reviewer, they are similar to Road Safety Audits. These analyses serve to advise project proponents and decision makers of any potential safety concerns and help to guide the development of the project.

The traffic impact analysis provides an opportunity for the reviewing agency to have safety considered in the project development. It further allows the preparer to work with the other disciplines in the development of a better project. For this to be effective, it is necessary for the traffic engineering profession to provide the training of personnel to conduct these analyses. The essential ingredients are the inclusion of safety considerations in the traffic impact analysis and the training of persons to conduct these studies.

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